In the Dublin University there are thirty-three fellowships, which are tenable for life, irrespective of the restriction of celibacy, and are now open to all without distinction of creed. The Commissioners think that it would be very desirable that in the election to Fellowships important original research should be regarded as a substantial element of merit.

The nature of the constitution of the Queen's University, Ireland, and its three colleges at Belfast, Cork, and Galway, is well known. The education to be obtained at these colleges is fairly complete, both on the scientific and literary side, and the examinations imposed by the University are such as to make its degrees of real value.

The evidence shows that the appliances for teaching are in some respects insufficient, and that there is a serious deficiency of funds for maintaining the efficiency of the Queen's Colleges in this respect. The Report concludes and recommends as follows with regard to the Queen's University in Ireland :—

"In founding the Queen's Colleges, the State did not adopt the principle of assisting and stimulating local efforts, and if we except the exhibitions and prizes, to which reference has been already made, as having been provided by public subscription, and a few other exhibitions which have been founded at Belfast, no voluntary contributions have been received by them. They are institutions for which the State has made itself responsible, and in which, as part of a University system, a complete scientific training is implied.

"As we think it of great importance that the sanction of the State should not be given to the teaching of science on a scale inadequate to ensure its efficiency, we recommend (1) That an increased annual grant be made to the Queen's Colleges for the purpose of providing assistants, apparatus, and the other necessary appliances of practical scientific teaching. We further recommend (2) that the Professorship of Natural History in the Queen's College, Belfast, be separated from that of Geology and Mineralogy."

The general conclusion reached, then, in this Seventh Report is that it would take very little to make London University nearly perfect as an examining and degree-granting body ; that Dublin University is in a healthy condition, and by a little amendment in the subjects of examination for her Scholarships and Fellowships, she might be an example to her sister Universities in England ; that the Queen's University, Ireland, and the four Scottish Universities are all working in the right lines, and that what they mainly require in order that they may develop into perfectly efficient teaching bodies, so far as science is concerned, are funds to provide the necessary men, buildings, and apparatus. No doubt the recommendations of the Commissioners in reference to these and other matters will receive serious attention in the proper quarter.

HERMANN'S "ELEMENTS OF HUMAN PHYSIOLOGY"

Elements of Human Physiology. By D. L. Hermann, Professor of Physiology at the University of Zurich. Translated by Arthur Gamgee, M.D., F.R.S. (London: Smith, Elder, and Co., 1875.)

FOR a considerable time a first-class work on the Elements of Physiology in our own language has been a desideratum. The bulky Handbook by Carpenter was framed in a nearly bygone era of the science ; Kirkes' smaller volume is under a similar disadvantage ; Huxley's excellent little book does not appeal to others than beginners, and the "Handbook to the Physiological Laboratory," by Drs. Sanderson, Foster, Brunton, and Klein, was never intended to fill the place of a manual. Dr. Gamgee steps forward to fill the gap with a carefully conducted and excellent translation of the fifth edition of Prof. Hermann's deservedly esteemed "Elements of Physiology," a work unequalled in the care which has been bestowed on the collecting and balancing of the investigations of authors from all quarters, as well as in its general construction and inherent unity of design.

Dr. Gamgee tells us, "After much hesitation and many doubts I decided not to annotate the text, for had explanatory notes, of the nature of commentaries with illustrations, been added to it, as I once intended, its appearance would have been still further delayed, and the work would have been materially altered in character —it would have ceased to have been Hermann's Physiology." We have a sufficiently high estimation of Dr. Gamgee's ability to think that the English reading public are the sufferers from his change of determination. The work being Hermann's therefore, and not in any way Gamgee's, except as far as the translation is concerned, our remarks apply only to the former.

The subject is treated in four sections, or parts. The first is entitled "The Exchanges of the Matter of the Organism" ; the second, "The Activities or Energies of the Body" ; the third, "The Liberating Apparatus ; the Nervous System" ; and the last, "Origin, Development, and Death of the Organism." As in most works on general subjects written by authors with any special predilections, the space devoted to the different functions is not quite that which would suggest itself to the unbiassed reader. As an instance of this in the present case we may refer to the fact that the account of the organ of sight alone occupies more than one-eighth of the volume, and nearly three times as much space as that devoted to the circulation of the blood.

The first part treats of the chemical constituents of the human body, the blood, and the circulation. The most advanced method of notation is adopted, and Baeyer's observations on the relations of uric acid are incorporated.

In the chapter on the blood we find one section devoted to the death of that fluid, the expression being employed to indicate those effects which follow its withdrawal from the influence of the walls of the living vessels. With reference to the movement of the blood in the circulatory system, we cannot help feeling that there is considerably more that might have been said about it with advantage, and that it might have been treated in a more connected and precise manner. Too much stress is laid on the aspiratory power of the thorax, which is assumed to be so continuous that "an ordinary expiration merely removes the inspiratory increase of the negative pressure." The duration of the systole of the ventricles of the heart is said not to vary with differences in the pulse-rate, according to the observations of Donders, which have been since shown to be incorrect. We are also led, incorrectly, to infer that the blood-pressure in the ventricles at the end of the diastole is a negative one ; that the

force of gravity is one of those which aids the circulation; that "all those vessels which carry blood *to* a capillary system are called arteries;" that in "scaly amphibia"—by which we assume reptiles are meant—the two ventricles always communicate, which is not true as far as the crocodiles and alligators are concerned; and that the heart of a warm-blooded animal, removed from the body, will continue to beat "so long as a supply of oxygenated blood is provided."

The term "secretion" in its widest sense is said to denote "all those processes in which substances quit the blood in an altered or unaltered condition." This involves the inclusion of that simple nutritive diffusion into tissues which results in the origin and growth of bone, cartilage, &c.; an unnecessary complication, we cannot help thinking, and one apt to mislead. When it is stated that "nothing is known about the formation and regeneration of bone-tissue, except the morphological appearances presented in the various stages," justice is not done to Dr. Beale's most ingenious and highly probable explanation of the process by which it comes into existence.

The second portion of the work discusses the energetic relations of the body. Parts give indications of having been evolved from the author's inner consciousness, when he might have appealed to sound fact. On the whole we prefer the way in which the subject is treated in Dr. Pavy's excellent work on "Food." Prof. Hermann's theory of muscular contractility, based entirely on slender analogies, does not impress itself on our attention more than does the not less satisfactory one of Dr. Radcliffe.

The "liberating" or "discharging" apparatus, in other words the nervous system, occupies the third section of the work. As our knowledge of the nerves is very superficial, remarks the author, it must suffice to establish empirically the conditions which increase, diminish, or destroy irritability. This is done in a most exhaustive and excellent manner. Prof. Hermann regards the phenomenon of electrotonus as an effect of contact, the contents of nerve-tubes which are dying or in activity being negative to the contents of nerve-tubes which are living and at rest. The chapters on special sense will be read with particular interest, from the masterly manner in which they are written. Why so much space is devoted to the horopter, a surface the physical relations of which are as much connected with stereoscopic photograph cameras and double magic lanterns as with eyes, we do not know. With regard to the author's ideas on the recent views promulgated by Hitzig, Fritsch, Nothnagel, and Ferrier, we will quote his own words. "The movements which have recently been induced by electrical stimulation, since they do not occur after mechanical or chemical stimulation, may very well be set down to the irritation of more deeply seated regions, for the latter are unavoidably exposed to the diffusion of currents. . . . . No results as to the nature and distribution of the functions of the cortex, even of the value of approximations, can be deduced from these experiments."

In the fourth section of the work a short account is given of the development of the embryo, not detailed enough to be of much service, except to the initiated.

This rapid glance at the contents of Prof. Hermann's work indicates that it adopts a method of treatment that is more modern than most. In perusing it in detail the incorporation of the results arrived at in all directions by physiologists during the last twenty years, makes its value still further apparent. The many conflicting statements which have sometimes to be made, without any explanation being given, leave several questions without any definite answer. Such must for some time be the case in a science so young as physiology. The authorities for the different statements introduced are given in every case where there might be any doubt, and the book would have been still further serviceable if references had been introduced to the publications in which the results are described, as well as to the author's name. Many, in looking through the work, will feel that much of the method and many of the phenomena there explained, which, although they have not made their way into our text-books, have been current in the oral tradition of physiological circles; they must remember that a considerable amount of capital has been made out of foreign investigations by those who have done little more than dole them out in a different language from that in which they originally appeared.

The arduous task of translation has been most conscientiously performed by Dr. Gamgee, who has evidently weighed, carefully and acutely, the unavoidably difficult forms of expression employed, many necessarily quite new on account of the novelty of the conceptions developed. Taking for example the word "Schwellenwerth," as employed with reference to Fechner's psycho-physical law which is shortly explained; at the suggestion of Dr. Sanderson it has been translated "liminal intensity," an expression which does not at first sight explain itself, as does "initial intensity," the rendering which first occurred to Dr. Gamgee. In physics "initial" is employed of velocities, and we are not sure that any other term was necessary.

In conclusion, there is no doubt that the appearance of this work has greatly reduced the need, at the present time, for any other treatise on the Elements of Physiology.

WHITE CONQUEST

White Conquest. By William Hepworth Dixon. Two vols. (London: Chatto and Windus, 1876.)

MR. DIXON has been again in America, this time to collect evidences of the struggle between the races that is being waged on that wide battle-field. Although his method of treating the subject is not such as quite to bring his work within the critical sphere of NATURE, and although the author makes no attempt to treat his subject scientifically, still even the scientific reader, the student of ethnology or of the characteristics of the various races of men, and he who takes an interest in the struggle for existence wherever it is being carried on, will find much in Mr. Dixon's striking pictures well fitted both to interest and instruct. It is not in our province to criticise the quality of the artistic element in the work, but about its fascination there can be no doubt. Of course the work is one-sided. We do not use the term by way of depreciation, but in its literal sense. Mr. Dixon's aim is to represent, by means of a